Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-94. (cancelled)

95. (new) A method of storing data segments in a rotatable storage media in a data storage device, comprising:

storing a first data segment in first tracks in the storage media, wherein the first tracks include a first start track and a first end track, the first data segment starts in the first start track at a start rotational phase, ends in the first end track at an end rotational phase, starts in adjacent first tracks at start rotational phases offset by an intra-segment rotational skew angle and ends in adjacent first tracks at end rotational phases offset by the intra-segment rotational skew angle; and

storing a second data segment in second tracks in the storage media, wherein the second tracks include a second start track and a second end track, the second data segment starts in the second start track at the start rotational phase, ends in the second end track at the end rotational phase, starts in adjacent second tracks at start rotational phases offset by the intra-segment rotational skew angle and ends in adjacent second tracks at end rotational phases offset by the intra-segment rotational skew angle;

wherein the first and second data segments are radially coherent, the first end track is adjacent to the second start track, and the start and end rotational phases are

offset by an inter-segment rotational skew angle that is greater than the intra-segment rotational skew angle.

96. (new) The method of Claim 95, wherein the first data segment is physically contiguous user data, and the second data segment is physically contiguous user data.

97. (new) The method of Claim 95, wherein the first data segment fills the user data storage areas in the first tracks, and the second data segment fills the user data storage areas in the second tracks.

98. (new) The method of Claim 95, wherein the first and second data segments are isochronous audio-video data, and the storage device provides the same forward and reverse sequential access times for the first and second data segments.

99. (new) The method of Claim 95, wherein the first and second data segments have the same size.

100. (new) The method of Claim 95, wherein the first and second data segments have the same number of logical block addresses, and a logical block address at the end rotational phase in the first end track is adjacent to a logical block address at the start rotational phase in the second start track.

101. (new) The method of Claim 95, wherein the first tracks include another first track between the first start and end tracks, and the second tracks include another second track between the second start and end tracks.

102. (new) The method of Claim 95, wherein the first tracks consist of the first start and end tracks, and the second tracks consist of the second start and end tracks.

103. (new) The method of Claim 95, wherein the first tracks are adjacent to one another, and the second tracks are adjacent to one another.

104. (new) The method of Claim 95, wherein the first end track is the only first track adjacent to a second track, and the second start track is the only second track adjacent to a first track.

105. (new) The method of Claim 95, wherein the first and second tracks have the same number of tracks.

106. (new) The method of Claim 95, wherein the inter-segment rotational skew angle is at least twice the intra-segment rotational skew angle.

107. (new) The method of Claim 95, wherein the inter-segment rotational skew angle is $360 - \alpha(N - 1)$ degrees where α is the intra-segment rotational skew angle, N is the number of first tracks and N is the number of second tracks.

108. (new) The method of Claim 95, wherein a rotational latency time for rotating the storage media across the intra-segment rotational skew angle is less than a rotational latency time for rotating the storage media across the inter-segment rotational skew angle.

109. (new) The method of Claim 95, wherein a rotational latency time for rotating the storage media across the intra-segment rotational skew angle is a seek time for moving the transducer head between adjacent first tracks and between adjacent second tracks.

110. (new) The method of Claim 95, wherein a rotational latency time for rotating the storage media across the inter-segment rotational skew angle is a seek time for moving a transducer head between the first end track and the second start track.

111. (new) The method of Claim 95, wherein the storage device is a disk drive.

112. (new) The method of Claim 95, wherein the storage device is a CD player.

113. (new) The method of Claim 95, wherein the storage device is a DVD player.

114. (new) The method of Claim 95, including:

storing a third data segment in third tracks in the storage media, wherein the third tracks include a third start track and a third end track, the third data segment starts in the

third start track at the start rotational phase, ends in the third end track at the end rotational phase, starts in adjacent third tracks at start locations offset by the intra-segment rotational skew angle and ends in adjacent third tracks at end locations offset by the intra-segment rotational skew angle;

wherein the first, second and third data segments are radially coherent and the second end track is adjacent to the third start track.

115. (new) A method of storing data segments in a rotatable storage media in a data storage device, comprising:

storing a first data segment in first tracks in the storage media, wherein the first tracks are adjacent to one another and include a first start track and a first end track, the first data segment starts in the first start track at a start rotational phase, ends in the first end track at an end rotational phase, starts in adjacent first tracks at start rotational phases offset by an intra-segment rotational skew angle and ends in adjacent first tracks at end rotational phases offset by the intra-segment rotational skew angle; and

storing a second data segment in second tracks in the storage media, wherein the second tracks are adjacent to one another and include a second start track and a second end track, the second data segment starts in the second start track at the start rotational phase, ends in the second end track at the end rotational phase, starts in adjacent second tracks at start rotational phases offset by the intra-segment rotational skew angle and ends in adjacent second tracks at end rotational phases offset by the intra-segment rotational skew angle;

wherein the first and second data segments are radially coherent and have the same size, the first tracks and the second tracks have the same number of tracks, the first end track is adjacent to the second start track, the start and end rotational phases are offset by an inter-segment rotational skew angle that is greater than the intra-segment rotational skew angle, and the inter-segment rotational skew angle is $360 - \alpha(N - 1)$ degrees where α is the intra-segment rotational skew angle and N is the number of tracks.

116. (new) The method of Claim 115, wherein the first data segment is physically contiguous user data that fills the user data storage areas in the first tracks, and the second data segment is physically contiguous user data that fills the user data storage areas in the second tracks.

117. (new) The method of Claim 115, wherein the first and second data segments are isochronous audio-video data, and the storage device provides the same forward and reverse sequential access times for the first and second data segments.

118. (new) The method of Claim 115, wherein the first and second data segments have the same number of logical block addresses, and a logical block address at the end rotational phase in the first end track is adjacent to a logical block address at the start rotational phase in the second start track.

119. (new) The method of Claim 115, wherein the first tracks include another first track between the first start and end tracks, and the second tracks include another second track between the second start and end tracks.

120. (new) The method of Claim 115, wherein the first tracks consist of the first start and end tracks, and the second tracks consist of the second start and end tracks.

121. (new) The method of Claim 115, wherein a rotational latency time for rotating the storage media across the intra-segment rotational skew angle is a seek time for moving a transducer head between adjacent first tracks and between adjacent second tracks.

122. (new) The method of Claim 115, wherein a rotational latency time for rotating the storage media across the inter-segment rotational skew angle a seek time for moving the transducer head between the first end track and the second start track.

123. (new) The method of Claim 115, wherein the storage device is a disk drive.

124. (new) The method of Claim 115, including:

storing a third data segment in third tracks in the storage media, wherein the third tracks are adjacent to one another and include a third start track and a third end track, the third data segment starts in the third start track at the start rotational phase, ends in the third end track at the end rotational phase, starts in adjacent third tracks at start locations

offset by the intra-segment rotational skew angle and ends in adjacent third tracks at end locations offset by the intra-segment rotational skew angle;

wherein the first, second and third data segments are radially coherent and have the same size, the first tracks, the second tracks and the third tracks have the same number of tracks, and the second end track is adjacent to the third start track.

125. (new) In a disk drive that includes a disk and a transducer head that reads from and writes to the disk, wherein the disk includes first tracks and second tracks, the first tracks are adjacent to one another and include a first start track and a first end track, the second tracks are adjacent to one another and include a second start track and a second end track, the first end track is adjacent to the second start track, the transducer head passes over the first start track, the first end track, the second start track and the second end track in sequence as the transducer head moves radially across the disk in a radial direction, the transducer head passes circumferentially over the disk in a rotational direction as the disk rotates, and a rotational skew angle occurs in the rotational direction relative to traversing tracks in the radial direction, a method of storing data segments that contain user data in the disk, comprising:

storing a first data segment in the first tracks, wherein the first data segment starts in the first start track at a start rotational phase, ends in the first end track at an end rotational phase, and in each adjacent pair of the first tracks, starts at start rotational phases that are offset by an intra-segment rotational skew angle and ends at end rotational phases that are offset by the intra-segment rotational skew angle; and

storing a second data segment in the second tracks, wherein the second data segment starts in the second start track at the start rotational phase, ends in the second end track at the end rotational phase, and in each adjacent pair of the second tracks, starts at start rotational phases that are offset by the intra-segment rotational skew angle and ends at end rotational phases that are offset by the intra-segment rotational skew angle;

wherein the first and second data segments are radially coherent and have the same size, and the start and end rotational phases are offset by an inter-segment rotational skew angle that is greater than the intra-segment rotational skew angle.

126. (new) The method of Claim 125, wherein the first data segment is physically contiguous user data that fills the user data storage areas in the first tracks, and the second data segment is physically contiguous user data that fills the user data storage areas in the second tracks.

127. (new) The method of Claim 115, wherein the first data segment is isochronous audio-video data from a first data stream, the second data segment is isochronous audio-video data from a second data stream, and the storage device provides the same forward and reverse sequential access times for the first and second data segments.

128. (new) The method of Claim 125, wherein the first and second data segments have the same number of logical block addresses, and a logical block address at the end

rotational phase in the first end track is adjacent to a logical block address at the start rotational phase in the second start track.

129. (new) The method of Claim 125, wherein the first tracks include another first track between the first start and end tracks, and the second tracks include another second track between the second start and end tracks.

130. (new) The method of Claim 125, wherein the first tracks consist of the first start and end tracks, and the second tracks consist of the second start and end tracks.

131. (new) The method of Claim 125, wherein the inter-segment rotational skew angle is $360 - \alpha(N - 1)$ degrees where α is the intra-segment rotational skew angle, N is the number of first tracks and N is the number of second tracks.

132. (new) The method of Claim 131, wherein the intra-segment rotational skew angle spans 20 to 30 percent of the 360 degrees.

133. (new) The method of Claim 125, wherein a rotational latency time for rotating the disk across the intra-segment rotational skew angle is a first seek time for moving the transducer head between adjacent first tracks and between adjacent second tracks, a rotational latency time for rotating the disk across the inter-segment rotational skew angle is a second seek time for moving the transducer head between the first end track and the second start track, and the first seek time is less than the second seek time.

134. (new) The method of Claim 125, including:

providing the disk with third tracks that are adjacent to one another and include a third start track and a third end track, wherein the second and third tracks have the same number of tracks, the second end track is adjacent to the third start track, and the transducer head passes over the second start track, the second end track, the third start track and the third end track in sequence as the transducer head moves radially across the disk in the radial direction; and

storing a third data segment in the third tracks, wherein the third data segment starts in the third start track at the start rotational phase, ends in the third end track at the end rotational phase, and in each adjacent pair of the third tracks, starts at start rotational phases that are offset by the intra-segment rotational skew angle and ends at end rotational phases that are offset by the intra-segment rotational skew angle;

wherein the first, second and third data segments are radially coherent and have the same size.

135. (new) In a disk drive that includes a disk and a transducer head that reads from and writes to the disk, wherein the disk includes first tracks and second tracks in a recording zone, the first tracks are adjacent to one another and include a first start track and a first end track, the second tracks are adjacent to one another and include a second start track and a second end track, the first end track is adjacent to the second start track, the transducer head passes over the first start track, the first end track, the second start track and the second end track in sequence as the transducer head moves radially across the disk in a radial direction, the transducer head passes circumferentially over the disk in

a rotational direction as the disk rotates, and a rotational skew angle occurs in the rotational direction relative to traversing tracks in the radial direction, a method of storing data segments that contain user data in the disk, comprising:

storing a first data segment in the first tracks, wherein the first data segment starts in the first start track at a start rotational phase, ends in the first end track at an end rotational phase, and in each adjacent pair of the first tracks, starts at start rotational phases that are offset by an intra-segment rotational skew angle and ends at end rotational phases that are offset by the intra-segment rotational skew angle; and

storing a second data segment in the second tracks, wherein the second data segment starts in the second start track at the start rotational phase, ends in the second end track at the end rotational phase, and in each adjacent pair of the second tracks, starts at start rotational phases that are offset by the intra-segment rotational skew angle and ends at end rotational phases that are offset by the intra-segment rotational skew angle;

wherein the first and second data segments are radially coherent and have the same size, the start and end rotational phases are offset by an inter-segment rotational skew angle that is greater than the intra-segment rotational skew angle, and the inter-segment rotational skew angle is $360 - \alpha(N - 1)$ degrees where α is the intra-segment rotational skew angle, N is the number of first tracks and N is the number of second tracks.

136. (new) The method of Claim 135, wherein the first data segment is physically contiguous user data that fills the user data storage areas in the first tracks, and the second

data segment is physically contiguous user data that fills the user data storage areas in the second tracks.

137. (new) The method of Claim 115, wherein the first data segment is isochronous audio-video data from a first data stream, the second data segment is isochronous audio-video data from a second data stream, and the storage device provides the same forward and reverse sequential access times for the first and second data segments.

138. (new) The method of Claim 135, wherein the first and second data segments have the same number of logical block addresses, and a logical block address at the end rotational phase in the first end track is adjacent to a logical block address at the start rotational phase in the second start track.

139. (new) The method of Claim 135, wherein the first tracks include another first track between the first start and end tracks, and the second tracks include another second track between the second start and end tracks.

140. (new) The method of Claim 135, wherein the first tracks consist of the first start and end tracks, and the second tracks consist of the second start and end tracks.

141. (new) The method of Claim 135, wherein the inter-segment rotational skew angle is at least twice the inter-segment rotational skew angle.

142. (new) The method of Claim 135, wherein the intra-segment rotational skew angle spans 20 to 30 percent of the 360 degrees.

143. (new) The method of Claim 135, wherein a rotational latency time for rotating the disk across the intra-segment rotational skew angle is a first seek time for moving the transducer head between adjacent first tracks and between adjacent second tracks, a rotational latency time for rotating the disk across the inter-segment rotational skew angle is a second seek time for moving the transducer head between the first end track and the second start track, and the first seek time is less than the second seek time.

144. (new) The method of Claim 135, including:

providing the disk with third tracks that are adjacent to one another and include a third start track and a third end track, wherein the second and third tracks have the same number of tracks, the second end track is adjacent to the third start track, and the transducer head passes over the second start track, the second end track, the third start track and the third end track in sequence as the transducer head moves radially across the disk in the radial direction; and

storing a third data segment in the third tracks, wherein the third data segment starts in the third start track at the start rotational phase, ends in the third end track at the end rotational phase, and in each adjacent pair of the third tracks, starts at start rotational phases that are offset by the intra-segment rotational skew angle and ends at end rotational phases that are offset by the intra-segment rotational skew angle;

wherein the first, second and third data segments are radially coherent and have the same size.

145. (new) A method of storing data segments in a rotatable storage media in a data storage device, comprising:

storing a first data segment that contains user data in first tracks in the storage media, wherein the first tracks are adjacent to one another and include a first start track and a first end track, the first data segment starts in the first start track at a start rotational phase, ends in the first end track at an end rotational phase, starts in adjacent first tracks at start rotational phases offset by an intra-segment rotational skew angle and ends in adjacent first tracks at end rotational phases offset by the intra-segment rotational skew angle; and

storing a second data segment that contains user data in second tracks in the storage media, wherein the second tracks are adjacent to one another and include a second start track and a second end track, the second data segment starts in the second start track at the start rotational phase, ends in the second end track at the end rotational phase, starts in adjacent second tracks at start rotational phases offset by the intra-segment rotational skew angle and ends in adjacent second tracks at end rotational phases offset by the intra-segment rotational skew angle;

wherein the first and second data segments are radially coherent and have the same size, the first and second tracks have the same number of tracks, the first end track is adjacent to the second start track, and the start and end rotational phases are offset by an inter-segment rotational skew angle that is greater than the intra-segment rotational

skew angle and is $360 - \alpha(N - 1)$ degrees where α is the intra-segment rotational skew angle and N is the number of tracks.

146. (new) The method of Claim 145, wherein the first and second data segments have the same number of logical block addresses, and a logical block address at the end rotational phase in the first end track is adjacent to a logical block address at the start rotational phase in the second start track.

147. (new) The method of Claim 145, wherein the intra-segment rotational skew angle spans 20 to 30 percent of the 360 degrees.

148. (new) The method of Claim 145, wherein a rotational latency time for rotating the storage media across the intra-segment rotational skew angle is a first seek time for moving a transducer head between adjacent first tracks and between adjacent second tracks, a rotational latency time for rotating the storage media across the inter-segment rotational skew angle is a second seek time for moving the transducer head between the first end track and the second start track, and the first seek time is less than the second seek time.

149. (new) The method of Claim 145, wherein the storage device is a disk drive.

150. (new) A method of storing data segments in a rotatable storage media in a data storage device, comprising:

providing a first data segment with physically contiguous user data and a second data segment with physically contiguous user data;

storing the first data segment in first tracks in the storage media, wherein the first tracks are adjacent to one another and include a first start track and a first end track, the first data segment starts in the first start track at a start rotational phase, ends in the first end track at an end rotational phase, starts in adjacent first tracks at start rotational phases offset by an intra-segment rotational skew angle and ends in adjacent first tracks at end rotational phases offset by the intra-segment rotational skew angle; and

storing the second data segment in second tracks in the storage media, wherein the second tracks are adjacent to one another and include a second start track and a second end track, the second data segment starts in the second start track at the start rotational phase, ends in the second end track at the end rotational phase, starts in adjacent second tracks at start rotational phases offset by the intra-segment rotational skew angle and ends in adjacent second tracks at end rotational phases offset by the intra-segment rotational skew angle;

wherein the first and second data segments are radially coherent and have the same size, the first and second tracks have the same number of tracks, the first end track is adjacent to the second start track, and the start and end rotational phases are offset by an inter-segment rotational skew angle that is greater than the intra-segment rotational skew angle and is $360 - \alpha(N - 1)$ degrees where α is the intra-segment rotational skew angle and N is the number of tracks.

151. (new) The method of Claim 150, wherein the first and second data segments have the same number of logical block addresses, and a logical block address at the end rotational phase in the first end track is adjacent to a logical block address at the start rotational phase in the second start track.

152. (new) The method of Claim 150, wherein the intra-segment rotational skew angle spans 20 to 30 percent of the 360 degrees.

153. (new) The method of Claim 150, wherein a rotational latency time for rotating the storage media across the intra-segment rotational skew angle is a first seek time for moving a transducer head between adjacent first tracks and between adjacent second tracks, a rotational latency time for rotating the storage media across the inter-segment rotational skew angle is a second seek time for moving the transducer head between the first end track and the second start track, and the first seek time is less than the second seek time.

154. (new) The method of Claim 150, wherein the storage device is a disk drive.

155. (new) A method of storing data segments in a rotatable storage media in a data storage device, comprising:

providing a first data segment with isochronous audio-video data from a first data stream and a second data segment with isochronous audio-video data from a second data stream;

storing the first data segment in first tracks in the storage media, wherein the first tracks are adjacent to one another and include a first start track and a first end track, the first data segment starts in the first start track at a start rotational phase, ends in the first end track at an end rotational phase, starts in adjacent first tracks at start rotational phases offset by an intra-segment rotational skew angle and ends in adjacent first tracks at end rotational phases offset by the intra-segment rotational skew angle; and

storing the second data segment in second tracks in the storage media, wherein the second tracks are adjacent to one another and include a second start track and a second end track, the second data segment starts in the second start track at the start rotational phase, ends in the second end track at the end rotational phase, starts in adjacent second tracks at start rotational phases offset by the intra-segment rotational skew angle and ends in adjacent second tracks at end rotational phases offset by the intra-segment rotational skew angle;

wherein the first and second data segments are radially coherent and have the same size, the first and second tracks have the same number of tracks, the first end track is adjacent to the second start track, and the start and end rotational phases are offset by an inter-segment rotational skew angle that is greater than the intra-segment rotational skew angle and is $360 - \alpha(N - 1)$ degrees where α is the intra-segment rotational skew angle and N is the number of tracks.

156. (new) The method of Claim 155, wherein the first and second data segments have the same number of logical block addresses, and a logical block address at the end

rotational phase in the first end track is adjacent to a logical block address at the start rotational phase in the second start track.

157. (new) The method of Claim 155, wherein the intra-segment rotational skew angle spans 20 to 30 percent of the 360 degrees.

158. (new) The method of Claim 155, wherein a rotational latency time for rotating the storage media across the intra-segment rotational skew angle is a first seek time for moving a transducer head between adjacent first tracks and between adjacent second tracks, a rotational latency time for rotating the storage media across the inter-segment rotational skew angle is a second seek time for moving the transducer head between the first end track and the second start track, and the first seek time is less than the second seek time.

159. (new) The method of Claim 155, wherein the storage device is a disk drive.

160. (new) A method of storing data segments in a rotatable storage media in a data storage device, comprising:

providing a first data segment with isochronous audio-video data from a first data stream and a second data segment with isochronous audio-video data from a second data stream;

storing the first data segment in first tracks in the storage media, wherein the first tracks are adjacent to one another and include a first start track and a first end track, the

first data segment starts in the first start track at a start rotational phase, ends in the first end track at an end rotational phase, starts in adjacent first tracks at start rotational phases offset by an intra-segment rotational skew angle and ends in adjacent first tracks at end rotational phases offset by the intra-segment rotational skew angle; and

storing the second data segment in second tracks in the storage media, wherein the second tracks are adjacent to one another and include a second start track and a second end track, the second data segment starts in the second start track at the start rotational phase, ends in the second end track at the end rotational phase, starts in adjacent second tracks at start rotational phases offset by the intra-segment rotational skew angle and ends in adjacent second tracks at end rotational phases offset by the intra-segment rotational skew angle;

wherein the first and second data segments are radially coherent and have the same size, the first and second tracks have the same number of tracks, the first end track is adjacent to the second start track, the start and end rotational phases are offset by an inter-segment rotational skew angle that is greater than the intra-segment rotational skew angle and is $360 - \alpha(N - 1)$ degrees where α is the intra-segment rotational skew angle and N is the number of tracks, and the storage device provides the same forward and reverse sequential access times for the first and second data segments.

161. (new) The method of Claim 160, wherein the first and second data segments have the same number of logical block addresses, and a logical block address at the end rotational phase in the first end track is adjacent to a logical block address at the start rotational phase in the second start track.

162. (new) The method of Claim 160, wherein the intra-segment rotational skew angle spans 20 to 30 percent of the 360 degrees.

163. (new) The method of Claim 160, wherein a rotational latency time for rotating the storage media across the intra-segment rotational skew angle is a first seek time for moving a transducer head between adjacent first tracks and between adjacent second tracks, a rotational latency time for rotating the storage media across the inter-segment rotational skew angle is a second seek time for moving the transducer head between the first end track and the second start track, and the first seek time is less than the second seek time.

164. (new) The method of Claim 160, wherein the storage device is a disk drive.

165. (New) In a data storage system including a data storage media having a rotatable recording surface, a method for storing data segments to the recording surface in concentric data tracks, comprising:

recording a set of data segments onto the recording surface, wherein each recorded data segment includes a start, an end and a rotational phase from the data segment to each of the other data segments in the set, the data segments are recorded with coherent relative rotational phases, each data segment includes one or more tracks, the rotational phase from one data segment to the other data segments is selected as a function of the number of tracks in each data segment and any skew angle between the tracks, the skew angle defines a circumferential offset between the tracks in each data

segment, and the rotational phase R from the end of a data segment to the start of any other data segment is $R = 360 - \alpha(N - 1)$ degrees where α is the skew angle between tracks within a data segment and N is the number of tracks in a data segment.

166. (new) In a data storage system including a data storage media having a rotatable recording surface, a method for storing data segments to the recording surface in concentric data tracks, comprising:

recording a set of data segments onto the recording surface, wherein each recorded data segment includes a start, an end and a rotational phase from the data segment to each of the other data segments in the set, the data segments are recorded with coherent relative rotational phases, each data segment includes one or more tracks, the rotational phase from one data segment to the other data segments is selected as a function of the size of the data segments, the number of tracks in each data segment and any skew angle between the tracks, the skew angle defines a circumferential offset between the tracks in each data segment, and the rotational phase R from the end of a data segment to the start of any other data segment is $R = 360 - \alpha(N - 1)$ degrees where α is the skew angle between tracks within a data segment and N is the number of tracks in a data segment.